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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,843	07/10/2003	Kenji Narita	K-2123	9989

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EXAMINER	
NGUYEN, TRAN N	
ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 02/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/615,843	NARITA ET AL.	
	Examin r	Art Unit	
	Tran N. Nguyen	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) 1-13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) 1-13 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Figures 9-15 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Claim Rejections - 35 USC § 112

3. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Among claims 1-13, the terms ***"which" "it"*** or ***"its"*** does not clearly reference for the intended referential subject matter or established-antecedent-basis subject matter. Corrections are required.

In claim 1, "*the rotor teeth have second tooth bodies which are inserted as rotor windings into a conductor plate*" is indefinite because it is unclear. In light of the spec, the above recitation is understood as "***the rotor teeth have second tooth bodies being inserted into conductor plate that serves as rotor winding***"

In claim 2, "*wherein the induction motor is a single-stator, double-rotor type, the induction motor comprising two each of the stator and rotor, the two stators being positioned back to back with each other being placed in opposing relation to the respective stators, the stator teeth of the two back-to-back stators being aligned with each other, and the windings around the stator teeth differing in magnetic polarity from the respective rotors*" is indefinite because of the following:

(1) the term "type" makes the recitation is indefinite;

(2) the recitation is "*single-stator double-rotor induction motor*", i.e., the induction motor comprises *one (i.e., single) stator* and *two (i.e., double) rotors*. This is contradictory to the recited phrase "the induction motor comprising *two each of the stator* and the *two stators being positioned back to back* with each other", i.e., two stator (not one single stator as recited in the previous line).

In light of the spec, the above recitation is understood as "***wherein the induction motor is a single-stator and double-rotor induction motor comprising a single stator having two stator portions being positioned back to back with each other, and two rotors being placed in opposing relation to the respective stator portions, the stator teeth of the two back-to-back stator portions being aligned with each other, and the windings around the stator teeth differing in magnetic polarity from the respective rotors***"

By similar token, **in claim 3**, "*wherein the induction motor is a double-stator, single-rotor type, the induction motor comprising two each of the stator and rotor, the two rotors being positioned back to back with each other in the center of the motor bracket, the two stators being placed in opposing relation to the respective rotors, the stator teeth of the two stators being aligned with each other, and the windings around the stator teeth differing in magnetic polarity from the respective rotors*" is indefinite because of the following:

(1) the term "type" makes the recitation is indefinite;

(2) the recitation is "*double-stator, single-rotor double-rotor induction motor*", i.e., the induction motor comprises *two (i.e., double) stator* and *one (i.e., single) rotors*. This is contradictory to the recited phrase "the induction motor comprising *two each of the stator and rotors* and the *two rotors being positioned back to back* with each other", i.e., two rotors (not one single rotor as recited in the previous line).

In light of the spec, the above recitation is understood as "***wherein the induction motor is a double-stator and single-rotor induction motor comprising two stators and a rotor, wherein the rotor having two rotor portions being positioned back to back with each other in the center of the motor bracket, the two stators being placed in opposing relation to the respective rotor portions, the stator teeth of the two stators being aligned with each other, and the windings around the stator teeth differing in magnetic polarity from the respective rotor portions.***"

In claim 5, *"wherein the stator yoke is made of a non-magnetic, non-conductive material instead of the magnetic steel plates"* , and **in claim 7**, "*wherein a conductive plate is used for the rotor yoke instead of the magnetic steel plates*" are indefinite because the independent claim 1, from which Claims 5 and 7 depend, recites the stator yoke and the rotor yoke are respectively laminated yokes of a plurality of blanked ring-shaped magnetic steel plates in the axial direction. Thus, claims 5 and 7 do not further limit the magnetic steel material as the limitations set forth in Claim 1, but rather changing the material of the yokes.

In claim 11, "where the rotor is fastened" is indefinite because the term "where" does not provide specific structural limitation thereof.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1, 6-7, 11 and 13** as understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Senckel (US 4095150) in view of Kliman (US 6320294).

Senckel discloses a n induction motor (figs 1-3) having a disk-shaped stators (5, 6) and a rotor (1) placed coaxially around a rotating shaft (2) with their surfaces opposing each other across a predetermined gap and causes a rotating magnetic field generated from windings in the stator to induce current in windings of the rotor, turning the rotor, wherein:

the stator includes a stator yoke (8, 9) and stator teeth (5, 6) the stator teeth have first tooth bodies around which stator windings (7) are wound and first tooth tips formed on those ends of the first tooth bodies which oppose the rotor; and,

the rotor (1) includes a rotor yoke and rotor teeth, the rotor yoke consists of a laminate made by laminating, in the axial direction, a plurality of blanked disk-shaped nonmagnetic plates, specifically aluminum (21) with a hole for insertion of a rotating shaft (2) at the center, the rotor teeth have second tooth bodies (10) which are projected from conductor plate (21) and second tooth tips formed on that end of the second tooth bodies which oppose the stator;

the stator windings (7) are fitted around the first tooth bodies between the stator yoke and first tooth tips, the rotor winding conductor plate (21) is fitted around the second tooth bodies and sandwiched between the rotor yoke and second tooth tips, the stator has the outer edge of the stator yoke secured in a motor bracket, and the rotor is fastened to a rotating shaft held by bearings of the motor bracket (fig 1).

Senckel substantially discloses the claimed invention, except for the following:

the stator yoke consists of a laminate made by laminating a plurality of blanked ring-shaped magnetic steel plates in the axial direction, holes for a predetermined number of slots are formed for first tooth bodies being fitted into the holes in the stator yoke;

the rotor yoke having holes for a predetermined number of slots are formed in the rotor yoke at equal intervals in the circumferential direction for inserting the rotor tooth bodies

Kliman, however, teaches a core structure having laminated yoke (48) formed by a plurality of laminated plates (48A) having a plurality of holes (60) and a plurality of tooth bodies (46A) are inserted into the holes (60). Kliman teaches that the core structure would improve performance characteristics and minimize material cost as well as facilitate manufacturing process. Therefore, those skilled in the art would realize that it would have been obvious to an artisan to apply Kliman's essential teaching to configure a motor's core structure, which can be used as a rotor core or a stator core, with laminated yoke having holes for inserting and securing the pole bodies therein.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the induction motor by configuring the stator yoke and the rotor yoke as respectively laminated yokes made by laminating a plurality of blanked magnetic plates in the axial direction, with holes for inserting respective tooth bodies into the holes, as taught by Kliman. Doing so would improve performance characteristics and minimize material cost as well as facilitate manufacturing process.

5. **Claim 2** is understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over **Senckel** and **Kliman,** as applied in the rejection against the base claim, and further in view of **Mole et al (US 5057726)** or **Varga (US 4959578).**

The combination of Senckel and Kliman refs substantially discloses the claimed invention, except for the added limitations of *the induction motor is a single-stator, double-rotor induction motor comprising a single stator having two stator portions being positioned back to back with each other, and two rotors being placed in opposing relation to the respective stator portions, the stator teeth of the two back-to-back stator portions being aligned with each other, and the windings around the stator teeth differing in magnetic polarity from the respective rotors.*

Mole (fig 1), or alternately and individually Varga (fig 10), teaches an induction motor having two stator portions being positioned back to back with each other, and two rotors being placed in opposing relation to the respective stator portions, the stator teeth of the two back-to-back stator portions being aligned with each other, and the windings around the stator teeth differing in magnetic polarity from the respective rotors. According to Mole, alternately Varga,

this motor structure would improve performance of the axial gap motor and reducing vibration therein.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the induction motor by configuring the motor as the induction motor is a single-stator, double-rotor induction motor comprising a single stator having two stator portions being positioned back to back with each other, and two rotors being placed in opposing relation to the respective stator portions, as taught by Mole or Varga. Doing so would improve performance of the axial gap motor and reducing vibration therein.

6. **Claims 4-5, 9, 10 and 12**, as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over **Senckel** and **Kliman,** as applied in the rejection against the base claim, in view of **Mole et al (US 5057726)** or **Varga (US 4959578)**, as applied to claim 4, and further in view of level of ordinary skills of a worker in the art.

Regarding claims, 4, 9-10 and 12, the combination of Senckel and Kliman refs substantially discloses the claimed invention, except for the added limitations of the stator or the rotor and the respective rotor or stator teeth are welded together, particularly by resistance welding, or the rotor is fastened to the shaft by press-fitting or shrinkage-fitting or caulking.

Those skilled in the art would understand that to fasten structural components by welding or by one of fastening methods of press-fitting or shrinkage-fitting or caulking is well known in the art, selecting a method of fastening to secure structural components of the motor is a matter of obvious engineering choice. Furthermore, in a structural claimed the method of forming language, i.e., welded by resistant welding, is not germane to the issue of patentability of the device itself. *(In re Thorpe, 227 USPQ 964, 966.)*

Thus, it would have been obvious to one skilled in the art at the time the invention was made to secure components of the stator or the rotor of the induction motor by welding or one of fastening methods of press-fitting or shrinkage-fitting or caulking because these securing methods are well known in the art.

Regarding the limitations of claim 5 which recites the material of the stator yoke is nonmagnetic and non-electrical conductive material, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the recited non-magnetical and non-electrical material for fabricating the stator yoke because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin, 125 USPQ 416.*

7. **Claim 3** is understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over **Senckel** and **Kliman,** as applied in the rejection against the base claim, and further in view of **Seitz (US 2573283).**

The combination of Senckel and Kliman refs substantially discloses the claimed invention, except for the added limitations of the induction motor is a double-stator and single-rotor induction motor comprising two stators and a rotor, wherein the rotor having two rotor portions being positioned back to back with each other in the center of the motor bracket, the two stators being placed in opposing relation to the respective rotor portions, the stator teeth of the two stators being aligned with each other, and the windings around the stator teeth differing in magnetic polarity from the respective rotor portions.

Seitz, however, teaches the induction motor (fig 1) having double-stator and single-rotor induction motor comprising two stators and a rotor, wherein the rotor having two rotor portions being positioned back to back with each other in the center of the motor bracket, the two stators being placed in opposing relation to the respective rotor portions. Seitz teaches that this motor structure would improve performance of the axial gap motor and reducing vibration therein.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the induction motor by configuring the motor as the induction motor is a single-rotor, double-stator induction motor, as taught by Seitz. Doing so would improve performance of the axial gap motor and reducing vibration therein.

Suggestion: *Claim 1 would be in more favorable for allowance consideration if claim 1 were amended as following:*

1. An induction motor which has a disk-shaped stator and rotor placed coaxially around a rotating shaft with **stator and rotor** [their] surfaces opposing each other across a predetermined gap and causes a rotating magnetic field generated from windings in the stator to induce current in windings of the rotor, turning the rotor, wherein:

the stator includes a stator yoke and stator teeth, the stator yoke consists of a laminate made by laminating a plurality of blanked ring-shaped plates in the axial direction, **wherein the blanked ring-shaped plates are formed by one of a magnetic steel plates and nonmagnetic plates and said blanked ring-shaped plates having** holes for a predetermined number of slots are formed in the stator yoke at equal intervals in the circumferential direction, the stator teeth have first tooth bodies **with** [around which] stator windings are wound **around thereon**, and first tooth tips formed on those ends of the first tooth bodies [which oppose] **opposing** the rotor, and the other ends of the first tooth bodies fit in the holes in the stator yoke;

the rotor includes a rotor yoke and rotor teeth, the rotor yoke consists of a laminate made by laminating, in the axial direction, a plurality of blanked disk-shaped **plates wherein the blanked disk-shaped plates are formed by one of a magnetic steel plates and nonmagnetic plates and said blanked disk-shaped plates having** [with] a hole for insertion of a rotating shaft at the center, **and a plurality of** holes for a predetermined number of slots are formed in the rotor yoke at equal intervals in the circumferential direction, the rotor teeth have second tooth bodies [which are] **being inserted** [as] **into a blanked ring-shaped conductor having a same corresponding holes and hole locations as said rotor yoke holes, wherein said blanked ring-shaped conductor functions as** rotor windings [into a conductor plate] and second tooth tips formed on that end of the second tooth bodies [which oppose] opposing the stator, and the other end of the second tooth bodies fitted in the holes in the rotor yoke; and

the stator windings are **wound** [fitted] around the first tooth bodies between the stator yoke and first tooth tips, the rotor **blanked ring-shaped conductor** winding [conductor] plate is fitted around the second tooth bodies and sandwiched between the rotor yoke and second tooth tips, the stator has the outer edge of the stator yoke secured in a motor bracket,

and the rotor is fastened to a rotating shaft held by bearings of the motor bracket.

Claims 2-13 also are required to correct all the 35 USC 112, 2nd paragraph, rejections.

Allowable Subject Matter

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran N. Nguyen whose telephone number is (703) 308-1639. The examiner can normally be reached on M-F 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Burton Mullins can be reached on (703)-305-7063. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tran N. Nguyen
Primary Examiner
Art Unit 2834